TROX® TECHNIK
The art of handling air

MULTILEAF DAMPER, VARIANT JZ-HL

Multileaf damper with actuator

OPPOSED BLADES

Opposed blades

JZ-HL

FOR LOW-LEAKAGE SHUT-OFF IN VENTILATION AND AIR CONDITIONING SYSTEMS

Rectangular multileaf dampers for volume flow and pressure control as well as for low-leakage shut-off of ducts and openings in walls and ceiling slabs

- Maximum dimensions 2000 × 1995 mm
- Closed blade air leakage to EN 1751, classes 1 – 2, depending on size
- Casing air leakage to EN 1751, class C
- Aerofoil opposed action blades
- Blades interconnected by external linkage
- Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- Actuators: Open/close actuators, modulating actuators
- Explosion-proof construction with pneumatic actuator or spring return actuator
- Powder-coated construction

General information

Application

- Multileaf dampers as a control element in the volume flow rate and differential pressure control in ventilation and air conditioning systems
- For low-leakage shut-off of ducts and openings in walls and ceiling slabs
- Steel and stainless steel variants with brass or stainless steel bearings are suitable for use in potentially explosive atmospheres (ATEX)

Special characteristics

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone
- Available in standard sizes and many intermediate sizes

Classification

Air leakage with closed multileaf damper according to EN 1751:
Test pressure up to 2000 Pa

- Up to B = 599 mm, class 1
- From B = 600 mm, class 2

Nominal sizes

- B: 200 – 2000 mm, in increments of 1 mm
- Width subdivided (BM): 2001 – 4150 mm, in increments of 1 mm
- H: 180, 345, 510, 675, 840, 1005, 1170, 1335, 1500, 1665, 1830, 1995 mm (intermediate sizes 183 – 1995 in increments of 1 mm, except for standard size H - 1 mm, H + 1 mm, H + 2 mm)
- Height subdivided (HM): 1999 – 4066 mm, in increments of 1 mm
- Any combination of B × H

Construction

Duct connection

- Corner holes on both sides
- G: Flange holes on both sides

Bearings

- Plastic bearings, operating temperature 0 – 100 °C
- M: Brass bearings, operating temperature 0 – 100 °C
- E: Stainless steel bearings, operating temperature 0 – 100 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)

- V: Reinforced blades available as from width 800 mm

Parts and characteristics

- Ready-to-install shut-off damper
- Blades with external linkage
- Drive arm

Attachments

- Quadrant stays and limit switches for the infinite adjustment of the multileaf dampers and for capturing the end positions
- Open/close actuators for opening and closing multileaf dampers
- Modulating actuators for variable damper blade positions
- Pneumatic actuators for opening and closing multileaf dampers
- Explosion-proof actuators for opening and closing multileaf dampers

Accessories

- Installation subframes for the fast and simple installation of multileaf dampers

Construction features

- Rectangular welded casing (P1: casing with screws), material thickness 1.25 mm
- Blades, material thickness 1 mm
- Flanges on both sides, suitable for duct connection, either flange holes or corner holes
- External linkage, robust and durable, consisting of the coupling rod and horizontal arms
- Blade shafts, Ø12 mm, with notch to indicate the damper blade position (not for ZS99)
- With drive spindle as an attachment: For the position of the spindle, see 'Dimensions and weight'
- With actuator as an attachment: The actuator is always attached to the second blade from the top
- Travel stop (angle section) ensures tight closure of the top and bottom blades
- Blade tip seals
- The construction and selection of materials comply with the criteria stipulated in European directives, referred to as ATEX (for use in potentially explosive atmospheres) for variants with brass or stainless steel bearings (-M, -E)

Material and surfaces

- Casing and blades made of galvanised sheet steel
- Blade shafts, drive arm and external linkage made of galvanised steel
- Blade tip seals made of PP/PTV plastic
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour

Standards and guidelines

- Casing air leakage to EN 1751, class C
- Meets the general requirements of DIN 1946, part 4, with regard to the acceptable air leakage with closed multileaf damper (from B = 600 mm)

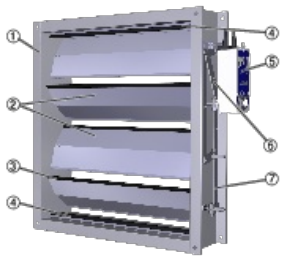
Maintenance

- Maintenance-free, as construction and materials are not subject to wear
- Contamination should be removed, as it may lead to corrosion and to increased closed blade air leakage

INFORMATION TECHNIQUE

Multileaf dampers with external linkage can have parallel action blades or opposed action blades. An external linkage transfers the synchronous rotational movement from the drive arm to the individual blades. Even very large multileaf dampers can be safely opened and closed with this type of linkage. Opposed action blades close at various speeds as the linkage includes a transverse link. This facilitates the closing process and reduces the air leakage in closed multileaf dampers.

Schematic illustration of JZ-HL



① Casing

② Opposed blades

③ Blade tip seal

④ Travel stop (angle section with seal)

⑤ Actuator

⑥ Transverse link

⑦ External linkage

The torques for operating multileaf dampers must be dimensioned in such a way that the damper can be safely opened and closed. For closure, the torque must suffice to ensure complete shut-off by the blades. Opening is initiated without the impact of aerodynamic forces. When air flows through the damper, the aerodynamic forces of the airflow create a closing force (torque) on the blades; this happens independent of the direction of the airflow. This closing force must be countered, or overcome. The blade angle α with the largest torque dependently of among other things, on the fan characteristics.

Nominal sizes	200 × 180 – 2000 × 1995 mm
Operating temperature	0 – 100 °C

Minimum torques [Nm]

H	**B**									
	200	**400**	**600**	**800**	**1000**	**1200**	**1400**	**1600**	**1800**	**2000**
180 – 1995	10	10	10	10	10	10	10	10	10	10

Steel and stainless steel multileaf dampers, free cross-sectional area [m²]

H	B									
	200	400	600	800	1000	1200	1400	1600	1800	2000
180 – 344	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.3
345 – 509	0.06	0.11	0.17	0.23	0.28	0.34	0.4	0.45	0.51	0.57
510 – 674	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
675 – 839	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.1
840 – 1004	0.14	0.27	0.41	0.55	0.69	0.82	0.96	1.1	1.23	1.37
1005 – 1169	0.16	0.33	0.49	0.66	0.82	0.98	1.15	1.31	1.47	1.64
1170 – 1334	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.72	1.91
1335 – 1499	0.22	0.43	0.65	0.87	1.09	1.3	1.52	1.74	1.96	2.17
1500 – 1664	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.95	2.2	2.44
1665 – 1829	0.27	0.54	0.81	1.08	1.36	1.63	1.9	2.17	2.44	2.71
1830 – 1994	0.3	0.6	0.89	1.19	1.49	1.79	2.08	2.38	2.68	2.98
1995	0.32	0.65	0.97	1.3	1.62	1.95	2.27	2.6	2.92	3.25

Intermediate sizes: Interpolate values between widths.

Maximum permissible static differential pressure [$\Delta p_{max\ t}$] in the case of closed multileaf damper

Construction	B						
	800	1000	1200	1400	1600	1800	2000
Standard construction	2500	2000	1650	1400	1250	1100	1000
Brass bearings (-M)	3000	2500	2200	1950	1750	1600	1500
Stainless steel bearings (-E)	3000	2500	2200	1950	1750	1600	1500
Reinforced blades (-MV, -E-V)	3500	3000	2700	2500	2300	2100	2000

Sound power level for a closed multileaf damper L_{WA} [dB(A)]

Δp_t	Area B × H [m²]							
	0.14	0.2	0.4	0.6	0.8	1.2	2	4
100	43	45	48	50	51	53	55	58
200	51	53	56	58	59	61	63	66
500	62	63	66	68	69	>70	>70	>70
1000	69	>70	>70	>70	>70	>70	>70	>70
1500	>70	>70	>70	>70	>70	>70	>70	>70
2000	>70	>70	>70	>70	>70	>70	>70	>70

Quick sizing tables provide a good overview of the sound power levels and differential pressures that can be expected. Approximate intermediate values can be interpolated. Precise intermediate values and spectral data can be calculated with our Easy Product Finder design program.

The sound power levels L_{WA} apply to multileaf dampers with a cross-sectional area (B × H) of 1 m².

The differential pressures apply to multileaf dampers installed in ducts (installation type A).

JZ-LL, JZ-LL-A2, JZ-HL, differential pressure and sound power level

v [m/s]	Damper blade position α									
	OPEN		20°		40°		60°		80°	
	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]
0.5	<5	<30	<5	<30	<5	7.5	22	34	250	63
1	<5	<30	<5	<30	8	26	85	53	1000	83
2	<5	<30	<5	<30	30	46	345	73	>2000	>90
4	<5	41	10	44	120	65	1385	>90	>2000	>90
6	<5	52	24	56	270	77	>2000	>90	>2000	>90
8	10	60	42	64	480	85	>2000	>90	>2000	>90

Rectangular multileaf dampers for volume flow and pressure control as well as for low-leakage shut-off of ducts and openings in walls and ceiling slabs. Ready-to-operate unit which consists of the casing, aerofoil blades and the blade mechanism. Flanges on both sides, suitable for duct connection. The blade position is indicated externally by a notch in the blade shaft extension. Closed multileaf damper air leakage according to EN 1751, class 2 (B ≤ 600 mm, class 1) Casing leakage according to EN 1751, class C.

Special characteristics

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone
- Available in standard sizes and many intermediate sizes

Material and surfaces

- Casing and blades made of galvanised sheet steel
- Blade shafts, drive arm and external linkage made of galvanised steel
- Blade tip seals made of PP/PTV plastic
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour

Construction

Duct connection

- Corner holes on both sides
- G: Flange holes on both sides

Bearings

- Plastic bearings, operating temperature 0 – 100 °C
- M: Brass bearings, operating temperature 0 – 100 °C
- E: Stainless steel bearings, operating temperature 0 – 100 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)

- V: Reinforced blades available as from width 800 mm

Technical data

Nominal sizes: 200 × 180 mm – 2000 × 1995 mm

- Operating temperature: 0 to 100 °C

Sizing data

- q_v (m³/h)
- Δp_t [Pa]

Air-regenerated noise

- L_{PA} [dB(A)]

JZ-HL	–	G	–	M	–		–	L	/	1000 × 1005	/	ER	/	Z64	/	NC	/	P1 - RAL 9010
1		2		3		4		5		6		7		8		9		10

1 Type
JZ-HL Low-leakage multileaf damper, closed blade air leakage to EN 1751, classes 1 – 2

2 Duct connection
No entry: corner holes on both sides,
G Flange holes on both sides (no corner holes)

3 Bearings
No entry: plastic bearings
M Brass bearings
E Stainless steel bearings

4 Construction of blades
Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings
V Reinforced blades, available from width 800 mm

5 Operating side
No entry: right
L left

6 Nominal size [mm]

Specify size width × height

Galvanised steel variants are available with the width or height subdivided
Width > 2000: width subdivided
Height > 1995: height subdivided

7 Installation subframe
No entry: without installation subframe
ER With installation subframe (duct connection G only)

8 Attachments
No entry: without attachment
Z04 – Z07 Hold open device
Z12 – Z51 Actuators
ZF01 – ZF15 Spring return actuators
Z60 – Z77 Pneumatic actuators

Explosion-proof actuators
Z1EX, Z3EX Electrical
Z60EX – Z77EX Pneumatic

9 Damper blade safety function
Only with spring return actuators or pneumatic actuators
NO pressure off/power off to OPEN (Normally Open)
NC pressure off/power off to CLOSE (Normally Closed)

10 Surface
No entry: standard construction
P1 powder-coated, specify RAL CLASSIC colour

Gloss level
RAL 9010 GU 50
RAL 9006 GU 30
All other RAL colours GU 70

Order example: JZ-HL–G–M–V–L/1200×675/ER/ZF06/NC

Duct connection	Flange holes on both sides
Bearings	Brass bearings
Construction of blades	Reinforced blades
Operating side	Left side
Nominal size	1200 × 675 mm
Installation subframe	With
Attachments	Spring return actuator, 20 Nm, 24 V AC/DC
Damper blade position	Power off to CLOSE
User interface	Standard construction